Nandia Oktaviani, 2016, Sintesis dan Karakterisasi Biokomposit HA-Alumina-Zirkonia sebagai Aplikasi *Bone Filler*. Skripsi dibawah bimbingan Drs. Adri Supardi M.S dan Drs. Djoni Izak R. M.Si., Program Studi S1 Fisika, Departemen Fisika, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Telah dilakukan pembuatan Biokomposit hidroksiapatit-alumina-zirkonia dengan metode perendaman busa. Bahan yang digunakan dalam penelitian ini meliputi hidroksiapatit, alumina, zirkonia, PVA dan busa *Polyurathane*. Pembuatan dilakukan dengan cara perendaman busa didalam *slurry* yang merupakan campuran larutan PVA (50 wt%) dan 40 wt% (hidroksiapatit dengan variasi komposisi alumina 21 wt%, 24 wt%, 20 wt%, 17 wt%, dan 15 wt% serta zirkonia 9 wt%, 6 wt%, 10 wt%, 13 wt%, dan 15 wt%). Setelah itu sampel dikeringkan dan dipanaskan pada temperature 650^0 C untuk menghilangkan busa dan PVA, kemudian dilakukan proses sintering sampel pada temperature 1200^0 C selama 3 jam. Berdasarkan analisa FTIR, uji porositas, uji kuat tekan dan SEM-EDX hasil terbaik ditunjukan pada sampel M3 karena memiliki diameter pori sebesar 98,6 - 467,4 µm dengan porositas 69,28 %, nilai *compressive strength* 0,593 MPa. Hasil tersebut belum memenuhi standart aplikasi *Bone Filler*. Penelitian selanjutnya perlu dilakukan penggantian busa *polyurethane* dengan busa PMMA dan pengoptimalan variasi waktu sintering, sehingga dihasilkan *bone filler* yang mengahasilkan standart aplikasi untuk kasus kanker tulang (*osteosarchoma)*.

Kata kunci : ***biokomposit hidroksiapatit, metode perendaman busa, sintering, diameter pori, porositas, compressive strength.***

Nandia Oktaviani, 2016, Synthesis and Characteristics Biocomposite HA-Alumina-Zirkonia for application of *Bone Filler*. This final assignment under the guidence of Drs. Adri Supardi M.S and Drs. Djoni Izak R. M.Si., S1 Physic Studies Program , Department of Physic, Faculty of Science and Technology, Airlangga, University, Surabaya.

ABSTRACT

It have been fabricated Biocomposite hydroxyapatite-alumina-zirconia with sponges soaking method. The materials used in this study is hydroxyapatite, alumina, zirconia, PVA and foam of *Polyurathane*. Preparation is carried out by immersing the foam in slurry which is a mixture of PVA (50 wt%) dan 40 wt% (hydroxyapatite with alumina 21 wt%, 24 wt%, 20 wt%, 17 wt%, and 15 wt% and then zirconia 9 wt%, 6 wt%, 10 wt%, 13 wt%, and 15 wt%). The sample was dried and heated at a temperature 650^0 C to remove foam and PVA, then the sample is carried out by sintering process at a temperature 1200^0 C for 3 hours. Based on FTIR analysis, porosity test, compressive strength test and SEM-EDX analysis, the best result was shown by sample M3 as having a pore diameter of 98,6 - 467,4 µm with 69,28% porosity, and compressive strength is 0,593 MPa. In further research needs to be repaired by replacing the polyurethane foam with PMMA changing the variation of sintering process, thus resulting bone fillerthat meet the standard for the application of bone cancer cases osteosarchoma

Keywords : ***biocomposite hydroxyapatite, foam immersion method, sintering, pore diameter, porosity, compressive strength.***